

ARISE - C-130 Hercules 09/07/14 Science Report

Aircraft:

[C-130H Hercules #439](#) ([See full schedule](#))

Date:

Sunday, September 7, 2014

Mission:

ARISE

Mission Location:

Arctic Ocean

Mission Summary:

CERES Gridbox- Flt 4

?Golden Day? was the phrase from the C-130 over the ESPO MTS xchat line during this flight! The target today was an area near 75N and 142W. Anthony Bucholtz (NRL) was the flight scientist. The C-130 flew a high altitude (22kft) radiation mapping mission over a period of about 2-hours that coincided with several CERES satellite overpasses, CloudSat and CALISPO. This was followed by a profile to the surface and a low-altitude survey of the radiative and microphysical properties of low clouds. One of the CERES instruments on TERRA was pre-programmed to rotate azimuthally as it passed thru the area in order to scan thru the midpoint of the region. This strategy provides up to 10 times more satellite radiation measurements in the area of study. The flight was coordinated with 7 NASA satellite overpasses and over a dozen other weather satellites also flew near the area providing a rich coincident dataset. The research pilots did an excellent job of getting the C-130 directly beneath the CALIPSO overpass on time as the A-Train flew overhead. While at altitude, the cloud conditions in general consisted of a low, fairly uniform stratus deck below, an occasional small, flat, thin cloud just above the stratus; no clouds between or at the aircraft altitude, and either clear, or thin, scattered cirrus above. The LVIS cloud channel captured the cloud top heights of the lower level clouds. The cirrus aloft were more prevalent on the southwest to northwest corners of the lawnmower pattern. The AQUA satellite scanners hit the target area twice during the high altitude lawnmower pattern. After the 2nd AQUA overpass, the C-130 made a level descent thru the grid-box to characterize the radiative flux and atmospheric state profile. The top of the low-level stratus deck was penetrated at about 1100 ft. Due to safety reasons, cloud base was never reached and appeared to be below 500 ft. The C-130 conducted an in-cloud leg to get some data from the cloud probes and then ascended to 100 ft above the cloud for a radiation leg. The C-130 descended again to 500 ft, which at this time happened to be just below cloud base. This low altitude cloud appeared to be more like fog, with a reported mono-modal size distribution at the lower levels of the cloud. The C-130 then flew a low altitude diagonal across the gridbox. It was mostly open ocean for this leg with an occasional patch of ice here and there. This constant altitude low-level leg occasionally penetrated thru lower cloud bases. Eventually, the bases were consistently below 500 ft so the C-130 ascended to 100 ft above the stratus cloud tops. After another unsuccessful dip to find cloud base, the C-130 made another above-cloud run 100 ft above the stratus tops with cirrus overhead, and during another TERRA overpass, before heading back to Fairbanks.

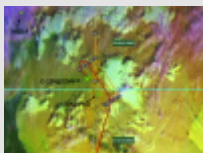
LVIS roll/pitch maneuvers were conducted on the transit to and from the target area at high altitude over a strip of open ocean just north of the coast. The flight concluded with a ramp overpass at 12,000 ft above Eielson for LVIS GPS.

This was an excellent flight day! All of the instruments worked well the entire flight.

The conditions were very good for the CERES satellite validation study and a nice arctic stratus cloud(s) experiment was conducted in variable cloud conditions.

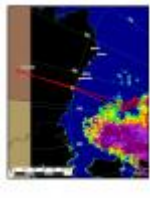
Images:

September 7, 2014 Figure 1



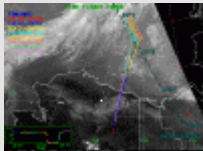
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September 7, 2014 Figure 2



[Read more](#)

September 7, 2014 Figure 3



[Read more](#)

Submitted by:

William L. Smith Jr. on 09/09/14

Related Flight Report:

C-130 Hercules 09/07/14 - 09/08/14

Flight Number:

CERES Gridbox - Flight #4

Payload Configuration:

ARISE

Nav Data Collected:

No

Total Flight Time:

8.4 hours

Submitted by:

Cate Easmunt on 09/07/14

Flight Segments:

From:	PAEI	To:	PAEI
Start:	09/07/14 18:15 Z	Finish:	09/08/14 02:40 Z
Flight Time:	8.4 hours		
Log Number:	141002	PI:	Christy Hansen
Funding Source:	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
Purpose of Flight:	Science		

Flight Hour Summary:

	141002	151004
Flight Hours Approved in SOFRS	229	
Flight Hours Previously Approved		88.7
Total Used	140.3	18.2
Total Remaining		70.5

151004 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
10/02/14 - 10/03/14	Cal Flight	Science	8.6	8.6	80.1
10/04/14	Transit	Transit	9.6	18.2	70.5

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Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

141002 Flight Reports					
Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
08/24/14	Engineering Check Flight	Check	2.8	2.8	226.2
08/29/14	Boom Calibration Flight	Check	0.5	3.3	225.7
08/30/14	Project Check Flight	Check	5.2	8.5	220.5
09/01/14	Transit (1 of 2)	Transit	8.7	17.2	211.8
09/02/14	Transit (2 of 2)	Transit	6.6	23.8	205.2
09/04/14 - 09/05/14	Arctic Ocean - Flight #1	Science	6.6	30.4	198.6
09/05/14 - 09/06/14	140W Sea Ice - Flight #2	Science	7.1	37.5	191.5
09/06/14 - 09/07/14	Ice ZigZag-Terra - Flight #3	Science	7.1	44.6	184.4
09/07/14 - 09/08/14	CERES Gridbox - Flight #4	Science	8.4	53	176
09/09/14 - 09/10/14	CERES Gridbox - Flight #5	Science	7.7	60.7	168.3
09/10/14 - 09/11/14	MIZ Lawnmower - Flight #6	Science	8.8	69.5	159.5
09/11/14 - 09/12/14	CERES Gridbox - Flight #7	Science	7.5	77	152
09/13/14 - 09/14/14	CERES Gridbox - Flight #8	Science	8.3	85.3	143.7
09/15/14 - 09/16/14	CERES Gridbox - Flight #9	Science	8.1	93.4	135.6
09/16/14 - 09/17/14	Radiation Wall Pattern - Flight #10	Science	8.3	101.7	127.3

09/17/14 - 09/18/14	CERES Gridbox - Flight #11	Science	7.2	108.9	120.1
09/18/14 - 09/19/14	Sea Ice Albedo/CryoSat - Flight #12	Science	8.6	117.5	111.5
09/19/14 - 09/20/14	Radiation Wall Pattern - Flight #13	Science	8.3	125.8	103.2
09/21/14 - 09/22/14	Sea Ice & Radiation - Flight #14	Science	8.2	134	95
09/24/14 - 09/25/14	Gridbox TOA+Surface - Flight #15	Science	6.3	140.3	88.7